

## Table of Contents

EXECUTIVE SUMMARY	vi
THE CHALLENGE	I
INTRODUCTION	2
THE APPROACH AND METHODOLOGY	5
EVALUATION PROCESS	7
Level I: Fatal Flaw Factors	8
Level II: Environmentally Sensitive Area Factors	20
Level III: Infrastructure Factors	21
Level IV: Community Factors	33
CONCLUSIONS	55
APPENDIX A - LEVEL I ELIMINATED COUNTIES AND PARISHES	58
APPENDIX B - LEVEL II ELIMINATED COUNTIES AND PARISHES	62
APPENDIX C - LEVEL III ELIMINATED COUNTIES AND PARISHES	63
APPENDIX D - LEVEL IV ELIMINATED COUNTIES AND PARISHES	64
APPENDIX E - INFORMATION FROM THE "CRITERIA AIR POLLUTANT REPORT"	65
MISSISSIPPI, LOUISIANA, AND ARKANSAS	
REFERENCE BIBLIOGRAPHY	70

## List of Figures

FIGURE 1 – DELTA REGIONAL AUTHORITY REGION	4
FIGURE 2 – WIND IMPACTS AND GEOLOGICAL ZONES	11
FIGURE 3 – NEW MADRID FAULT LIQUEFACTION FIELD	15
FIGURE 4 – CRUDE OIL TRUNK LINES	24
FIGURE 5 – MISSISSIPPI PORTS	27
FIGURE 6 – LOUISIANA PORTS	28
FIGURE 7 – ARKANSAS RIVER PORTS	29
FIGURE 8 – HIGHWAY SYSTEM	31
FIGURE 9 – CHICOT COUNTY, ARKANSAS	37
FIGURE 10 – EAST CARROLL PARISH, LOUISIANA	39
FIGURE 11 – RICHLAND PARISH, LOUISIANA	41
FIGURE 12 – ST. JAMES PARISH, LOUISIANA	43
FIGURE 13 – BOLIVAR COUNTY, MISSISSIPPI	45
FIGURE 14 – LEFLORE COUNTY, MISSISSIPPI	47
FIGURE 15 – PANOLA COUNTY, MISSISSIPPI	49
FIGURE 16 – PIKE COUNTY, MISSISSIPPI	51
FIGURE 17 – WASHINGTON COUNTY, MISSISSIPPI	53

## Abbreviations

API – American Petroleum Institute  
ASCE – American Society of Civil Engineers  
BACT – Best Available Control Technology  
BIA – Bureau of Indian Affairs  
DDHS – Delta Development Highway System  
DOT – Department of Transportation  
DOE – Department of Energy  
DRA – Delta Regional Authority  
EJ – Environmental Justice  
EIS – Environmental Impact Statement  
EPA – Environmental Protection Agency  
ESA – Endangered Species Act  
FHWA – Federal Highway Administration  
LOOP – Louisiana Offshore Oil Port  
NAAQS – National Ambient Air Quality Standards  
NIST – National Institute of Standards and Technology  
NOAA – National Oceanic and Atmospheric Administration  
OSHA – Occupation Safety and Health Administration  
PADD – Petroleum Administration for Defense District  
PM-10 Emissions – Particulate Matter larger than 10 micrometers  
TVA – Tennessee Valley Authority  
USACE – United States Army Corps of Engineers  
USDA – United States Department of Agriculture  
USGS – United States Geologic Service  
VOC – Volatile Organic Compounds  
WCI – Waterways Council, Inc.  
WSA – Wilbur Smith Associates

## Definitions

**N**ATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS) – The Clean Air Act, amended in 1990, requires EPA to set National Ambient Air Quality Standards (40 CFR part 50) for pollutants considered harmful to public health and the environment. The Clean Air Act provided for two types of national air quality standards; primary standards that establish limits to protect public health, including the health of sensitive populations for children and the elderly, and secondary standards that set limits to protect the public welfare to include decreased visibility and damage to animals, crops, vegetation, and buildings. EPA established six principal pollutants which are known as criteria pollutants: carbon monoxide, lead, nitrogen dioxide, particulate matter (PM-10 and PM-2.5), ozone, and sulfur oxides. There are primary standards and timeframes established for each of these criteria pollutants.

**VOLATILE ORGANIC COMPOUNDS (VOCs)** – VOCs are organic chemical compounds that, under normal conditions, have high enough vapor pressures to significantly vaporize and enter the atmosphere, contributing to air pollution. Some react with nitrogen oxides in the air and sunlight to form ozone. Common sources of VOCs include solvents, some constituents of petroleum fuels such as gasoline and natural gas, paint thinners, and even cows.

**PM-10** – Airborne particulate matter results from a variety of substances that are suspended in the air in the form of particles, either liquid or solid, which may occur in varying sizes and cause irritation and health concerns for many people. Particulate matter that is less than 10 micrometers in diameter is of the greatest concern because it can pass into the lungs. Levels of these pollutants may not affect healthy people, but those individuals with respiratory diseases, cardiovascular disease, children with certain chronic conditions, and the elderly may suffer health consequences from exposure to particulates.

**SUPERFUND SITES** – According to the U.S. Environmental Protection Agency, Superfund Sites are sites where uncontrolled or abandoned hazardous waste is located, possibly affecting the local ecosystem or people. There are extensive regulations associated with the use and cleanup of these sites.

**National Ambient Air Quality Standard** – The Clean Air Act, which was last amended in 1990, requires EPA to set National Ambient Air Quality Standards (40 CFR part 50) for pollutants considered harmful to public health and the environment. The Clean Air Act established two types



of national air quality standards. Primary standards set limits to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

**NON-ATTAINMENT AREAS** – The Clean Air Act of 1990 defines a “non-attainment area” as a locality where air pollution levels persistently exceed National Ambient Air Quality Standards or that contribute to ambient air quality in a nearby area that fails to meet standards. Designating an area as non-attainment is a formal process and EPA normally takes this action only after air quality standards have been exceeded for several consecutive years. EPA designations of non-attainment areas are only based on violations of national air quality standards for carbon monoxide, lead, ozone (1-hour), particulate matter (PM-10), and sulfur dioxide.

**OZONE SEASON DAILY AVERAGE** – The Clean Air Act of 1990 requires EPA to establish standards for ground-level ozone along with five other criteria pollutants. The Clean Air Act established two types of standards for ground-level ozone: primary standards and secondary standards. Ground-level ozone is monitored on a one-hour and eight-hour average. The eight-hour standard considers the three-year average of the fourth highest daily maximum eight-hour average ozone concentration measured at each monitoring station.

**NITROGEN OXIDE EMISSIONS** – Nitrogen oxides form when fuel burns at high temperatures. These emissions can cause a variety of health and environmental problems according to the Environmental Protection Agency. These problems include ozone and smog which are created in the atmosphere from nitrogen oxides, hydrocarbons, and sunlight. Nitrogen oxide emissions also contribute to the formation of particulate matter through chemical reactions in the atmosphere.

**PETROLEUM ADMINISTRATION FOR DEFENSE DISTRICT** – A geographic aggregation of the 50 states and the District of Columbia into five districts.

**DELTA DEVELOPMENT HIGHWAY SYSTEM** – Based on the report released in February 2007 by the DRA, the DDHS totals 3,843 miles of roadways throughout the region and the estimated cost to complete planned improvement projects on these roads totals \$18.5 billion. Of the 3,843 miles, approximately 1,025 miles (27%) are already multi-laned.

## Executive Summary

The Delta Regional Authority (DRA) was established by Congress in 2000 to enhance economic development and improve the quality of life for residents of this region. The DRA region encompasses 240 counties and parishes in eight states (Alabama, Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri and Tennessee) just south of St. Louis to New Orleans. Led by federal co-chairman Pete Johnson, who is appointed by the president and confirmed by the Senate, the DRA fosters partnerships throughout the region to improve the regional economy. The DRA is a federal-state partnership created to provide a unified voice for the DRA region on a variety of important issues ranging from job training to health care to education to employment, each of which is highly dependent upon transportation to succeed.

The oil industry is very important to the DRA region: it provides thousands of jobs and is a huge economic engine. Damage caused by Hurricanes Katrina and Rita in 2005 greatly compromised the Delta's oil refining industry capabilities. These storms shut down more than 20 percent of the nation's oil refining capability, which is centered in the Gulf Coast region. The DRA and governors of the eight states reacted quickly to the dilemma of having the nation's oil refining capabilities imperiled by these unprecedented hurricanes by hiring Wilbur Smith Associates (WSA) to conduct a comprehensive analysis of the oil refinery industry and evaluate the 240 counties and parishes in the DRA region to identify potential areas to locate a new oil refinery facility.

Petroleum-based transportation fuels are critical to the U.S. economy. The Gulf Coast is the heart of the U.S. energy industry, producing or importing more than 60 percent of the country's supply of crude oil and generating half of the country's refined product. The Department of Energy, Energy Information Administration, estimates that the U.S. will need an additional 7 million barrels of oil per day by 2025 to meet projected increases, principally due to transportation demand. A significant increase in refining capacity will be required to meet this demand, and this report identifies areas within the DRA region that are well-suited to construct a new oil refinery facility.

Energy resources in the U.S. require a very complex network of infrastructure to transform them into the right products and deliver them to the appropriate locations. That infrastructure is supported by power generators, a network of ports and highways, telecommunication and information networks, water resources, and most importantly a workforce that provides the human



capital needed to make all of this possible. This report identifies areas within the DRA region that are best suited to construct an oil refinery facility based upon existing infrastructure and workforce.

In order to properly identify locations in the DRA region suitable for an oil refinery facility, a site selection matrix was developed, which included identifying evaluation criteria in each of the following four areas:

- Weather Impacts and Geological Zones;
- Environmentally Challenged or Sensitive Areas;
- Infrastructure Factors; and
- Community Constraints.

Once the evaluation criteria were developed, the following four evaluation levels were developed to screen the 240 counties and parishes in the DRA region:

- Level I – Fatal Flaw Factors;
- Level II – Environmental and Sensitive Area Factors;
- Level III – Infrastructure Factors; and
- Level IV – Community Factors.

Based on the Level I, II, III and IV evaluation process and consultation with state agencies in the DRA region, the following nine counties and parishes in the DRA region were identified as potential sites to construct an oil refinery facility:

- Bolivar County, Mississippi;
- Chicot County, Arkansas;
- East Carroll Parish, Louisiana;
- Leflore County, Mississippi;
- Panola County, Mississippi;
- Pike County, Mississippi;
- Richland Parish, Louisiana;
- St. James Parish, Louisiana; and
- Washington County, Mississippi.





While the initial evaluation process is designed to identify sites suitable for a new oil refinery facility, private investors will ultimately analyze a series of detailed costs and benefits before making the decision to invest the billions of dollars necessary to construct a state-of-the-art oil refinery facility. The DRA region will play a key role in meeting the country's future energy demands, based upon its strategic location, workforce and existing energy and multimodal transportation infrastructure.